

2018 NURU ETHIOPIA IMPACT REPORT



RAY MARSHALL CENTER FOR THE STUDY OF HUMAN RESOURCES

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2018 NURU ETHIOPIA IMPACT REPORT

AUGUST 2019

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This report is commissioned by Nuru International



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EXECUTIVE SUMMARY

INTRODUCTION

In 2013, Nuru Ethiopia (NE) set out to provide meaningful choices that empower communities to lift themselves out of poverty in a sustainable way. The integrated Nuru model seeks to address four key areas of need: 1) food insecurity, 2) inability to cope with economic shocks, 3) unnecessary disease and death, and 4) lack of quality education for children. Between 2013 - 2015, NE developed the Agriculture, Financial Inclusion, Healthcare, and Education impact programs to design solutions for these areas of need by using the Program Planning Process¹ (PPP). In 2016, the Agriculture and Financial Inclusion programs combined to make the Rural Livelihoods Program.

To track program impact, the NE Monitoring and Evaluation (M&E) team collects yearly evaluation data to support all data-driven decision making. In 2016, Nuru International partnered with the Ray Marshall Center (RMC), an applied research and policy institute, to better understand program outcomes and impacts. This report provides results for Rural Livelihoods (RL), Healthcare (HC), and Education (ED).

RURAL LIVELIHOODS

RL achieved impact in several indicators including increased crop yields over baseline, increased agricultural profit, high cash savings behavior, and high-value body condition ratings for the goats and sheep. There are, however, two areas that require more attention in the coming year. First is to increase the profitability of crop and livelihood diversification (LD) activities, which will help Nuru households make active and informed choices about their diversified livelihood strategies. Currently, households are making about \$44 from NE crop and LD activities, not enough to ensure households can make meaningful choices. Next is improving households' ability to minimize exposure to shocks and to recover quickly after exposure. Key findings of the 2018 impact report include:

¹ The PPP is a training-based, facilitated, co-creative approach to developing the programmatic intervention between the local community, Nuru Ethiopia and Nuru International teams.

- The intervention group achieved a crop yield increase of 73% as compared to their baseline and a comparison group.
- Nuru households were 107% more profitable than non-intervention farmers when they invested in Nuru crop-based services and products.
- Nuru households made a combined income of \$44.
 - \$32 from agriculture
 - \$12 from livelihood diversification
- 91% of Nuru households experienced a crop loss shock which cost, on average, \$82.

HEALTHCARE

This year, the Nuru Ethiopia Healthcare Program achieved a 28% reduction in under-five mortality due to the healthy behavior adoption rates. Indeed, Nuru households maintained higher adoption rates over their baseline and as compared to the non-Nuru group for the past three years. With the exception of trainings being postponed due to security concerns, the monitoring targets were met and exceeded as the year progressed. Overall, the behavior change supported by tailored interpersonal communication within the care groups for Nuru households continues to show progress. Key findings of the 2018 impact report include:

- Nuru households adopted 63% of the eight healthy behaviors, an increase of 40% over the baseline compared to an increase of only 18% for the comparison group.
- The cost per life saved in 2018 as calculated with the total care group programming cost is \$976 and the cost per person per year is \$2.14.

EDUCATION

In 2018, the Nuru Ethiopia Education Program saw increases across the core components of reading for both the Nuru and comparison group, but literacy rates remain low. Close analysis of effect size, however, demonstrates that the Nuru cohort is improving in literacy skills at a faster rate. Key findings of the 2018 impact report include:

- At baseline, comparison students outperformed Nuru students by 214% on average percentage of letters identified (out of 50). By 2018, Nuru children improved at a faster rate displaying a large effect size of 0.84 while the comparison students had a moderate effect size of 0.44
- Despite the overall small gains in literacy results, students are completing sub-tasks they were unable to during baseline:
 - For average % of words identified, only 14 Nuru students completed the assessment at baseline. In 2018, 124 students completed the sub-task.
 - For number of correct words per minute, zero students could complete the sub-task at baseline. In 2018, 23 Nuru students successfully completed the sub-task this year.
- The 2018 monitoring data shows that 87% of the 287 teachers implemented improved literacy best practices versus the 87 teachers trained in 2016.

RURAL LIVELIHOODS

INTRODUCTION

The NE RL Program aims to build the capacities, assets, and income of farmer households to achieve diversified livelihoods and to cope with shocks. To accomplish this aim, NE supports activities that impact crop yield, livestock, food security, and household income, as well as increasing access to and use of formal financial services and improving financial literacy. Agricultural Extension and Rural Livelihoods (AERL) field officers and Cooperative field officers provide technical training, extension services, and cooperative support structures through formal partnerships with the Government of Ethiopia's primary cooperative institutions. AERL field officers focus on agricultural training and extension with farmers. Cooperative field officers are responsible for coaching and training primary cooperative management teams and leading financial inclusion activities with women cooperative members.

OBJECTIVE

This report is the first RL follow-up assessment that integrates the impact results of all agriculture, financial inclusion, and livelihood diversification activities at NE. The following presentation of individual-level data provides an update on the progress Nuru farmer households are making towards improving crop production, livestock fattening, increasing household income, improving savings and loan behavior, and coping with shocks. The available evaluation and monitoring data were used to generate recommendations for the program.

The Nuru Monitoring and Evaluation (M&E) team supports this work by conducting an annual assessment (Table 1) towards the evaluation question: What is the impact of the Nuru Ethiopia Rural Livelihoods Program?

Table 1. Rural Livelihoods survey timeline and sample sizes

Study Group	Sample Size: Agriculture	Sample size: Financial Inclusion	Sample size: Livelihood Diversification	# of Enumerators	Data collection dates
Nuru	1,419	1,042	414	14	Jan 28 – April 4, 2019
Comparison	512	570	NA		

METHODOLOGY

In April 2014, NE conducted a baseline study of its first cohort of farmer households (intervention group) and non-intervention households (comparison group) across seven kebeles within Boreda Woreda, Gamo Gofa Zone, Southern Nations, Nationalities, and Peoples’ Region (SNNPR). The study design intends to capture attributable impact by comparing the results of the intervention to a non-intervention comparison.

In 2017, the NE RL Program introduced a Livelihood Diversification (LD) loan product that was integrated with best management practice training and extension for goat and sheep fattening. Since 2015, NE has provided loans to women household members for unspecific income-generating activities (“IGA loans”) as a means of diversifying household income. In 2015, the annual household survey conducted by NE confirmed that at least 85% of the NE supported farmer households were using the IGA loans for livestock-related activities. The interest in loans for livestock, and with the intent of improving impact by combining microfinance with training and extension, led to re-design of the program’s approach to these loans. There is no non-intervention comparison group for LD. Instead, Nuru examines the combined household income generated from agriculture and livelihoods.

Each year, the NE M&E team hires and trains a team of temporary enumerators to collect impact data on the following indicators:

- Crop equivalent yield
- Agricultural income
- Livelihood diversification income

- Savings behavior and access to financial services
- Coping with shocks
- Loan behavior

Crop Equivalent Yield

For purposes of comparability across Nuru and non-Nuru farmers and versus baseline, Nuru Agriculture and M&E employ a single composite indicator of crop performance: Crop Equivalent Yield (CEY).

The CEY calculation converts the performance of select crops into one standard unit of maize kilograms per acre. This is done using the farm gate prices per kilogram of haricot beans and maize. Finally, M&E transforms all crops into maize via the price ratios of haricot beans versus maize. One way to interpret this calculation is to ask: If farmers only grew maize this season, how much maize would they have produced?

In 2017, there was a methodological change in measuring farmers' land sizes. Previously, the M&E team paced each field to obtain crop areas.² As Nuru farmer numbers increased, pacing became prohibitively time-intensive and expensive for the small NE M&E team. To address this, the M&E team stopped pacing Nuru intervention farmers and instead uses loan package details to calculate land sizes based on the amount of seed provided and seed spacing. Since Nuru farmers are trained on and apply a standard planting spacing, calculating cropped area based on the planting rate of seeds per area was determined to be an equivalently precise method to pacing. The pacing methodology remains in use for the comparison group.

Agricultural Profits

Revenue, costs, and profits are calculated only for the particular crop production farmers engage in as part of the Nuru package. Revenue is calculated by multiplying the average crop equivalent yield by the average farm gate price for maize. The intervention and comparison groups have particular methods to establish the costs they incurred in farming their particular plots. The cost for Nuru farmers

² Pacing methodology measures the distance in a field.

is the loan price for the improved farm inputs (seed and fertilizer) provided by Nuru cooperatives. The cost for the comparison group, on the other hand, is calculated using the cost of farm inputs from local suppliers and takes into account farm input adoption rates gathered from survey responses. With the support of Nuru extension services, Nuru farmers deploy all improved inputs, while not all comparison farmers use improved seed and fertilizer. Under ideal growing conditions, increased investment in improved inputs should lead to increased productivity. Finally, net profit or loss is calculated by subtracting the costs from revenue.

Livelihood Diversification Profits

Similar to agricultural profits, the LD income model averages the purchase price for two small ruminants (“shoats”) along with other fattening related expenses (medications and feed) and the revenue generated from the sale of the same two small ruminants. These data points are used to calculate the profit or extra income generated from the program activity.

MONITORING

In addition to yearly impact evaluations, the NE RL team collects monitoring data throughout the year (Table 2). While evaluations focus on a sample of farmers, program teams monitor the entire Nuru farmer population. The monitoring data provides NE country teams with quarterly data for real-time data-driven decision making. Key takeaways:

- RL surpassed targets in the following areas: Number of Nuru farmers, percent increase in crop yield compared to baseline, number of Nuru savers, number of LD loans issued this year.
- RL fell slightly short of targets in the following areas: Total cumulative deposits and LD repayment rate
- RL was substantially short of targets in the following areas: Average deposit amount per person per quarter.

Table 2: 2018 Monitoring Results

Indicator	Performance ³	Target	Actual
Number of Nuru farmers		5,000	6,038
Percent increase in crop yield compared to baseline		32%	73%
Number of Nuru savers		2,000	2,522
Average deposit amount per person (USD) per quarter		\$2.86	\$2.02
Total deposits (USD) cumulative		\$6,500	\$5,090
Number of livelihood diversification loans issued this year (cumulative per year)		500	1,369
Livelihood diversification repayment rate		97%	72%

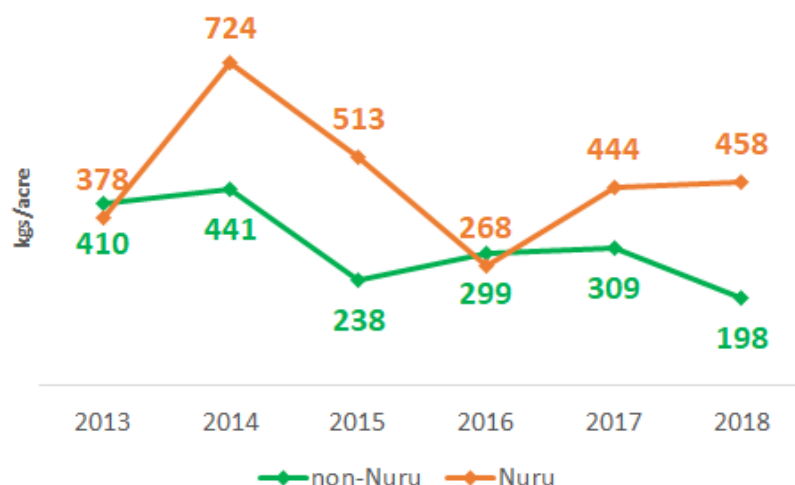
RESULTS & DISCUSSION

Crop Yield

Nuru farmers invested their time, resources and energy in Nuru agricultural training, services, and products, in addition to the full suite of integrated Nuru development services. Nuru farmers increased their crop yields by 21% over baseline compared to a decrease of 52% for non-intervention farmers (a difference of 73 percentage points). Nuru farmers receiving the integrated intervention services from Nuru Ethiopia had an overall yield of CEY maize at an average of 458 kgs/acre, which can be compared with the non-Nuru cohort in Figure 1. The percentage change from 2017 to 2018 for each cohort is listed below:

- Nuru integrated intervention farmers increased their crop yield by 3%.
- Comparison farmers decreased their yields by -36%.

³ The indicator is considered fulfilled if it achieves 75% of the target.

Figure 1. Kgs/acre crop equivalent yield comparison 2013-2018⁴

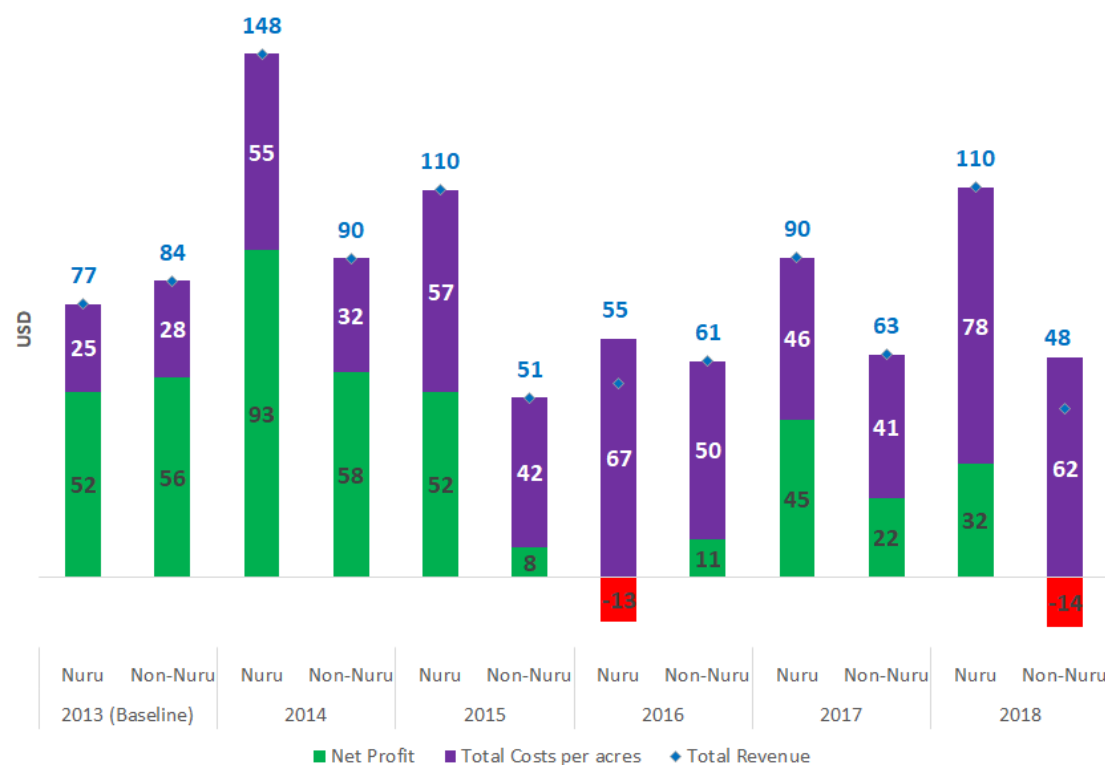
Income Model

In 2018, Nuru farmers were 107% more profitable than non-intervention farmers (Figure 2). The extra \$46 of income generated by Nuru farmers offers households an opportunity to recover from consecutive years of below average and highly variable rainfall conditions across southern Ethiopia, including the emergence of new pests like Fall Armyworm. The cost of inputs per acre increased by 70% from 2017 to 2018. The increase in crop yields for Nuru farmers helped to offset the rising costs of inputs.

A key variable in the income model is the “price per kg” of maize. In 2018, Nuru-supported cooperatives offered their farmers a higher price point for maize than 2017, which was the result of improved cooperative management and the maturity of Hidota Cooperative Union. The average selling price in 2018 was \$24 USD per quintal and only \$20 USD in 2017.

⁴ CEY from 2013 - 2015 are from the 2015 NE Agriculture Impact Report, prior to RMC’s analysis.

⁵ CEY from 2013 - 2016 is for the 2014 Cohort, only.

Figure 2. Total Revenue, Cost, and Profits per Acre

Livelihood Diversification

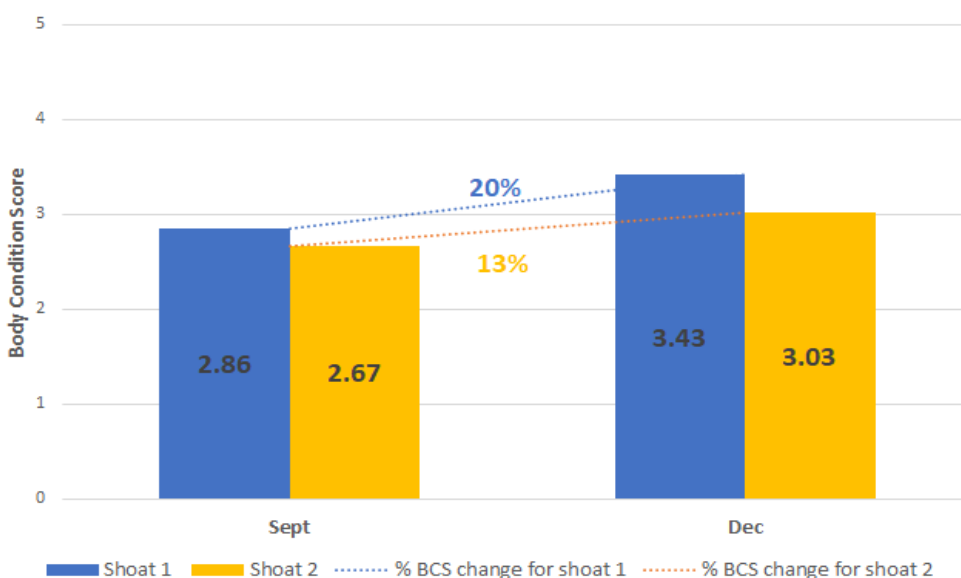
The NE Livelihood Diversification (LD) loan product is integrated with best management practice training and extension for goat and sheep (shoat) fattening. Nuru women savers qualify for a loan equivalent to 2 or more goats or sheep for 3 rounds of fattening and sale if they repay their previous loans 100% and meet certain savings requirements (see savings section). The goal of these activities is to increase the resilience and economic empowerment of women in Nuru farmer households that are over-dependent on rain-fed cash crops like maize, beans, and teff for their household income.

More than 90% of the women participants that qualified for the LD loan in 2018 would recommend the program activities to their neighbors, which is indicative of high satisfaction with the LD activities and a high willingness to promote those activities to others in their communities.

Nuru staff were trained to examine the physiological features, weight, height and overall health of the shoats being managed by participating women. They used the BCS scoring methodology to assess the effectiveness of improved feeding and fattening activities. 2018 monitoring data indicates that

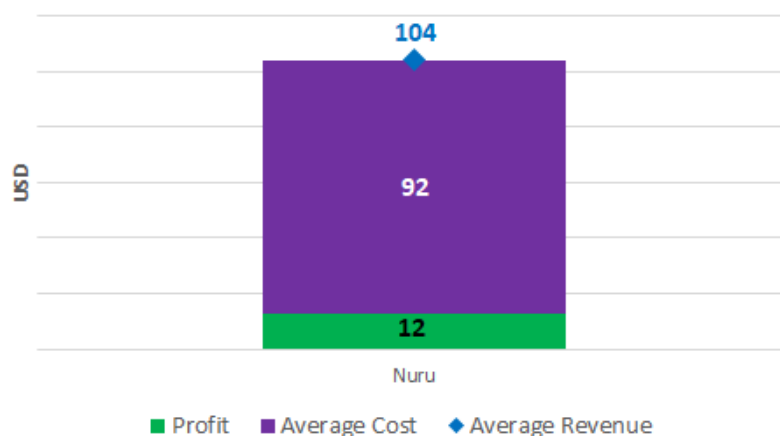
women increased the body condition score (BCS) of shoat 1 and shoat 2 by 20% and 13% (Figure 3), respectively, over a three-month period. The LD activities promote fattening as a business, which requires animals to increase their BCS value in 3-4 months.

Figure 3. 2018 September vs December Body Condition Scores



In 2018, the price of shoats increased in the operating area for Nuru Ethiopia. These price increases were consistent across crop and livestock commodities. Moreover, 2018 plans to improve the market linkages for participating women through aggregating their fattened shoats and selling them to private sector companies were disrupted by political and social unrest in the NE operating area. Therefore, NE has prioritized activities related to improving market linkages in 2019 with the belief that these efforts will improve the profits generated from this activity. If there is no dramatic improvement in the profit generated from this activity in 2019, NE and the cooperatives they support will need to reconsider the potential continuation of shoat fattening as a business. In 2018, women generated an average of \$12 USD of profit from fattening two shoats (Figure 4). The costs are inclusive of the purchase price of the animal and average costs for additional medications and feeds.

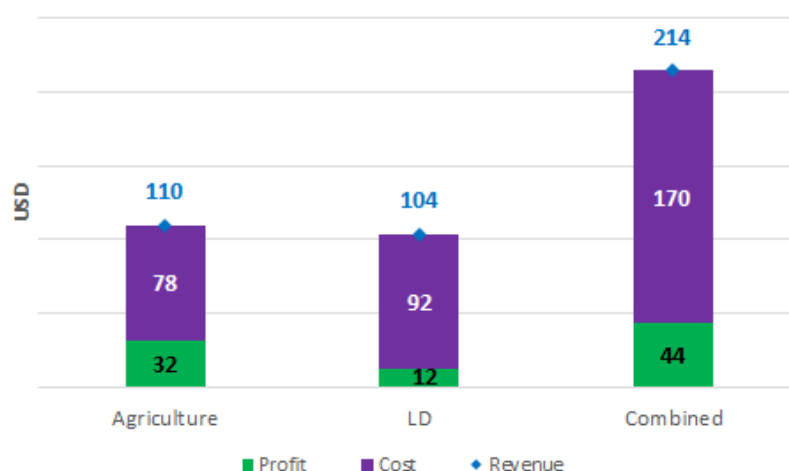
Figure 4. 2018 LD Income Model



Combined Income Model

Improving on-farm and household income is a key feature of the NE rural livelihoods program. Households that participate in the two primary program activities, maize and bean production, and shoat fattening, have an opportunity to generate extra income from those activities. This is the first year that Nuru has combined the extra income (profit) generated from those activities. In short, participation in these two activities generated \$44 USD (Figure 5) in profit that would have otherwise not been generated without the program activities.

Figure 5. 2018 Agriculture and LD Combined Income Model



Savings Behavior and Access to Financial Services

Nuru women savers qualify for LD loans only if they display consistent (bi-weekly) savings behavior and reach a minimum bi-weekly savings threshold of \$0.75 USD (20 ETB). This generates a minimum annual savings of about \$20 USD, which was enough savings to cope with crop loss in 2017. As discussed later, the costs of shocks have dramatically increased in 2018 and Nuru Ethiopia will have to consider these cost increases when communicating, training and providing financial extension to Nuru households saving under LD program activities.

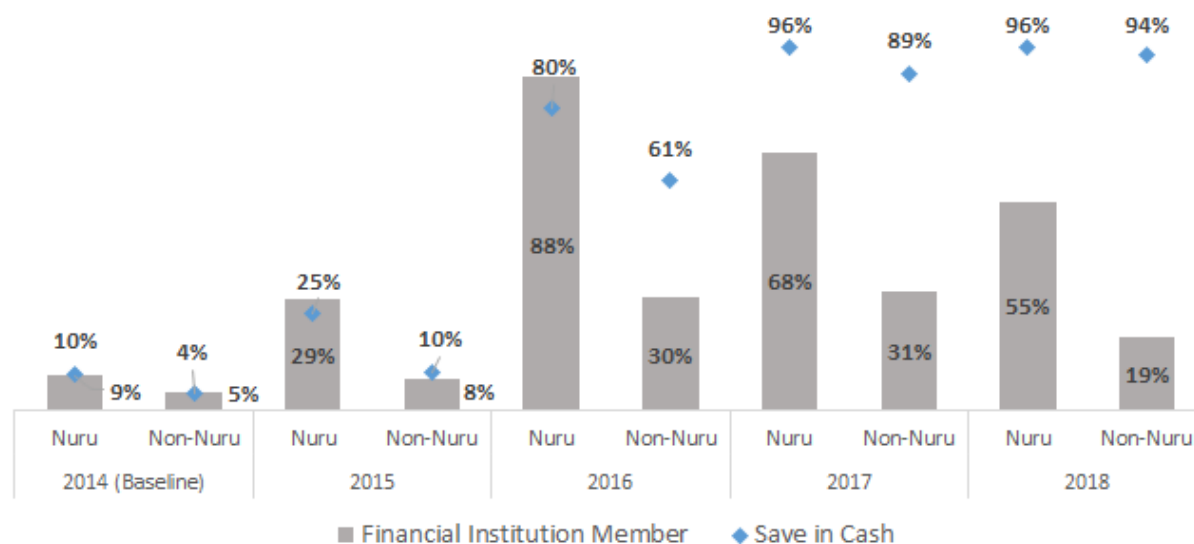
In 2018, both Nuru women savers and non-intervention comparison women continued to save in the form of cash (not including assets or livestock) with intervention households nearing 100% (Figure 6) for the second year in a row. Nuru women savers are still more likely than non-intervention women to save their liquid cash assets with secure and credit building financial institutions. However, from 2017 to 2018, Nuru participants decreased participation in formal financial institutions by 20%.

Formal financial institutions are defined as associations that are legally recognized, like the Commercial Bank of Ethiopia, microfinance institutions (MFIs) and cooperatives. Formal financial institutions provide greater savings security and the opportunity to build credit. Informal community institutions like iddir⁶ and equub,⁷ on the other hand, provide access to loans, but their security and lending habits are less reliable than formal financial institutions.

The absolute savings of Nuru women savers through their cooperatives indicates that the amount being saved is not sufficient to cope with the common shocks experienced in rural areas. Based on monitoring data, Nuru households are gradually increasing their average savings from an average of \$2.02 in 2017 and 2018 to \$2.30 by the middle of 2019. This cash is saved through the cooperative, which acts as formal financial institutions in rural areas. It should be noted that Nuru women savers do not save all their cash through their cooperatives. Nuru Ethiopia has re-focused financial inclusion activities in 2018 to incentivize formal institutional savings by linking savings frequency at the cooperative with the qualifications for accessing the livelihood diversification loan product for shoat fattening.

⁶ Iddir is an informal insurance network of households to help each other cover costs such as funeral expenses.

⁷ Equub is an informal credit and savings collective.

Figure 6. Percentage of farmers who save in cash and deposit to a financial institution⁸

Coping with Shocks

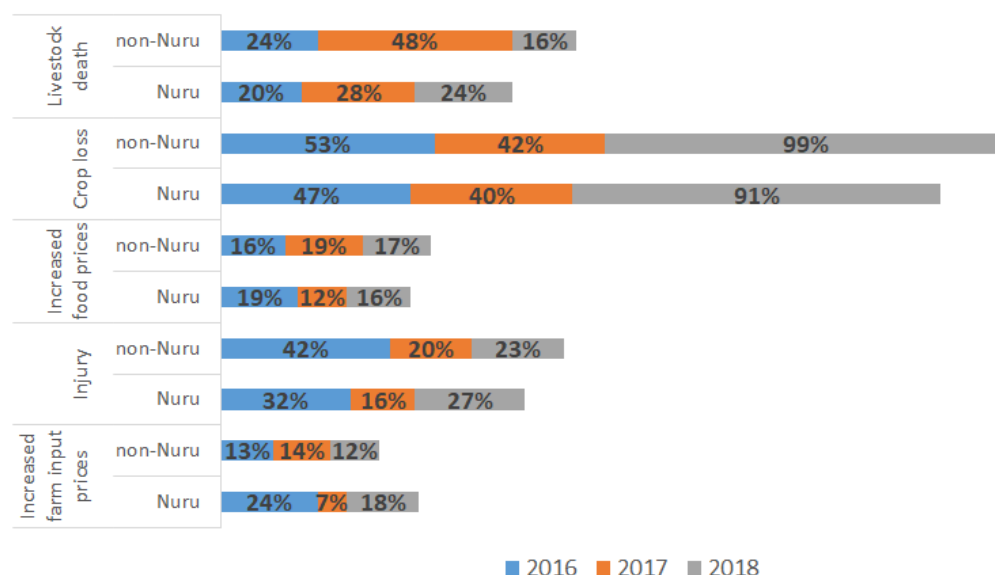
In 2018, the most frequent emergencies (Figure 7) were crop loss (91%), injury (27%), and livestock death (24%). Crop loss continues to be a top shock for Nuru and non-intervention groups for the third year in a row. There is a likely correlation between high seasonal rainfall variability conditions and the emergence of FAW with crop loss continuing to be the most common shock faced by households in the NE operating area. Until this year, crop loss was one of the most affordable emergencies but is now upwards to \$85 (Table 3).

In 2018, both groups saw decreases in livestock death since 2017, but the cost to cope with this emergency is now \$143. This is a trend of heightened importance for NE considering the rural livelihoods program invests in livelihood diversification (LD) activities focused on goat and sheep fattening. Similarly, crop loss and livestock death can be attributed to high seasonal rainfall variability and FAW, since the primary feedstock for many households is seasonal grasses that are negatively impacted by both volatile rainfall variability and FAW. Moreover, rainfall variability has limited the availability of surface water for animals and households. This shock highlights the importance of LD

⁸ In 2015, the survey question “Do you save in cash?” was updated to clearly differentiate between cash savings and physical assets. Additional probing questions contributed to the sharp increase in the 2016 results.

activities that aim to improve animal best management practices and management of improved grass species less susceptible to drought.

Figure 7. Percentage of Respondents Experiencing Emergencies, 2016-2018



The cost of coping with these emergencies have increased across the board for farmers. As a result of these dramatic increases in the cost of coping with emergencies, current average savings targets are not sufficient for coping with any shock or emergency identified by respondents.

Table 3: Average cost⁹ of emergencies for Nuru farmers

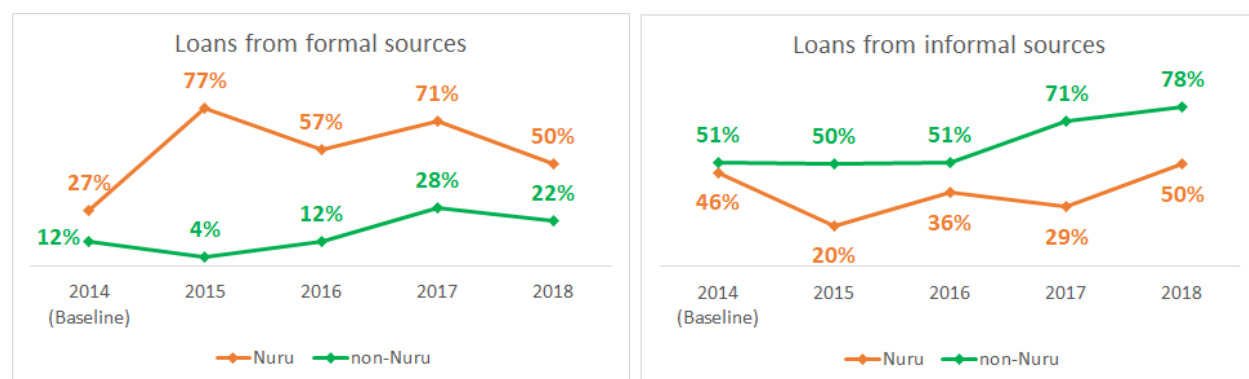
Emergency	2016	2017	2018
Death	\$129	\$103	\$267
Increased farm input prices	\$50	\$56	\$55
Injury	\$44	\$57	\$65
Increased food prices	\$33	\$57	\$69
Crop loss	\$22	\$10	\$82
Livestock death	\$20	\$41	\$143

⁹ Exchange rate: 27 USD to 1 ETB.

Other Loan Sources and Behaviors

When coping with shocks households in rural Ethiopia often look to informal sources for the funds needed. This year, there was an uptick of both Nuru (50%) and comparison (78%) farmers who obtained loans from informal sources like friends, family, and iddir (Figure 8). In contrast, Nuru farmers taking out loans from formal sources decreased by 30%.

Figure 8. Percentage of loans from formal sources vs informal sources



CONCLUSION AND RECOMMENDATIONS

In 2018, RL achieved impact in several indicators including increased crop yields over baseline, increased agricultural profit, high cash savings behavior, and increases in the body condition score for shoats under fattening. The key programmatic area that requires more attention in the coming year is to increase the profitability of crop and LD activities, which will help Nuru households make active and informed choices about their diversified livelihood strategies. Currently, households are making about \$44 USD from NE-supported crop and LD activities, not enough to ensure households can make meaningful choices. Improving the market linkage activities for crops and livestock requires leadership by Hidota Union and the Primary Cooperative leadership in building new market relationships, improving the quality and quantity of production and maintaining trust with their membership.

Based on these results, recommendations and next steps include:

- Increasing quarterly savings behavior of women farmers.
- Improving the quality, value, and marketability of crops and livestock produced by cooperative members (farmers and savers) to increase absolute income.

- Execute a shoat market linkage strategy and ensure that women farmers receive higher selling prices for their fattened shoats.
- Exploring new strategies for quantifying annual cash savings that include all formal financial institutions that service savers, not just the cooperatives.

HEALTHCARE

INTRODUCTION

With the intent of improving maternal and child health, the Nuru Ethiopia (NE) Healthcare (HC) Program works with Nuru farmer households to promote the adoption of eight healthy behaviors. The chosen healthy behaviors have been proven by technical research to decrease unnecessary disease and death, particularly for mothers and young children. The Nuru HC Program utilizes evidence from the World Health Organization, which identifies the need to focus on maternal and child health (MCH).¹⁰ USAID's best practices on how to efficiently and effectively improve MCH through behavior change also guides the HC Program implementation.¹¹

Nuru Ethiopia delivers healthcare services via tailored interpersonal communication and the cooperative care group model. The tailored interpersonal communication approach employs observation and in-depth discussions to understand the specific needs of each household and where they fall in the stages of change continuum (pre-contemplation, contemplation, preparation, action, and maintenance phases). Small women's groups and elected volunteer leaders are trained to provide Nuru family households with information about maternal and child health behaviors and ways to put them into practice. Community-based activities are undertaken in partnership with the government including improving community health workers' capacity and connection to the community, improving access to water, and partnering with the community and government to construct maternal waiting homes and nutrition counseling corners in health facilities.

OBJECTIVE

This report is the third follow-up assessment for the HC program at NE. NE HC impact is assessed in two ways. First, Nuru measures the adoption rate in three areas:

¹⁰ WHO. Children: reducing mortality. Updated October 2017. Retrieved 2018 June 25 from <http://www.who.int/mediacentre/factsheets/fs178/en/index.html>

¹¹ USAID: Acting on the Call: Ending Preventable Child and Maternal Deaths, June 2014; Technical Approaches to Proven Interventions by USAID, Ensuring Healthy Behaviors p107-110. Retrieved 2017 January 17 from https://www.usaid.gov/sites/default/files/documents/1864/USAID_ActingOnTheCall_2014.pdf

- Healthcare Overall Healthy Behaviors
- Safe Pregnancy and Childbirth
- Safe Water, Sanitation and Malaria Prevention

Second, Nuru calculates the change in percent reduction in under-five mortality applying the Lives Saved Tool (LiST).

The Nuru Monitoring and Evaluation (M&E) team supports this work by conducting an annual assessment (Table 4) towards the evaluation question: What is the impact of the Nuru Ethiopia Healthcare Program on Nuru farmer households?

Table 4. Healthcare survey timeline and sample sizes

Study Group	Sample size	% of HHs with children 0-23 months old	% of HH with children 24-59 months old	# of Enumerators	Data collection dates
Nuru	1,042	18%	43%	14	Jan 28 – April 4, 2019
Comparison	570	16%	47%		

METHODOLOGY

Scorecards

NE M&E and HC developed three scorecards to measure household health behaviors (Table 5). NI M&E's approach to counting the number of healthy behaviors a person engages in is a modified version of the Center for Disease Control and Prevention's methodology which shows that people live longer as they engage in a greater number of healthy behaviors.¹² With the exception of handwashing, each healthy behavior is scored on a binary scale. In other words, there is a total possible score of 1 for each behavior successfully adopted. The Overall Healthy Behaviors Scorecard represents the summation of the other two scorecards.

¹² See https://www.cdc.gov/media/releases/2011/p0818_living_longer.html for further details.

The analysis section that follows presents scorecard averages and incidence rates for the eight specific indicators.

Table 5. Nuru Healthcare Scorecards

Overall Healthy Behaviors Scorecard (8 out of 8 healthy behaviors)	
Safe Pregnancy and Childbirth Scorecard (5 out of 8 healthy behaviors)	4 or more ANC visits
	Delivery in a health center
	Immediate breastfeeding
	Exclusive breastfeeding
	Complementary breastfeeding
Safe Water, Sanitation, and Malaria Prevention Scorecard (3 out of 8 healthy behaviors)	Appropriate handwashing with soap
	Safe drinking water
	Sleep under LLIN

Lives Saved Tool

This report will include calculations from the Lives Saved Tool (LiST) for the first time. LiST is modeling software designed to estimate the impact of maternal and child health (MCH) interventions on mortality in low and middle-income countries.¹³ The tool disaggregates the effectiveness of each Nuru MCH indicator (except for safe drinking water) based on peer-reviewed literature and the software's mathematical algorithm. After entering the annual evaluation results, the tool calculates an estimated percent reduction in under-five mortality.

LiST was developed as part of the Lancet's Child Survival Series in 2003. In 2008, the tool was further developed by the Child Health and Epidemiology Reference Group with funding from the Gates Foundation. It was then shifted into the public domain as part of the Spectrum suite and is maintained

¹³ <https://www.livessavedtool.org/>

by the John Hopkins School of Public Health. LiST estimates are utilized in reporting by USAID's Acting on the Call, UNICEF, Save the Children, and PATH, as well as in peer-reviewed journals.¹⁴

MONITORING

In addition to yearly impact evaluations, the NE HC team collects monitoring data (Table 6) throughout the year. While evaluations focus on a sample of farmers, program teams monitor the entire Nuru farmer population. Overall, the HC team exceeded all monitoring targets with the exception of the number of community health workers trained. Nuru aims to strengthen existing government systems by directly training government community health workers. These trainings build sustainability, readiness to hand over, and behavior change and quality of care in the local system. The second tranche of training was postponed because planned scaling to Zala was paused due to security issues in the area.

Table 6: 2018 Monitoring Results

Indicator	Performance ¹⁵	Target	Actual
Total Nuru women participating in cooperative care groups		2,400	2,444
Percent of women who are on track to attend at least 4 antenatal care visits per quarter		75%	99%
Percent of deliveries in a clinic per quarter		60%	100%
Number of community health workers trained		196	100

RESULTS & DISCUSSION

Scorecard: Overall Healthy Behaviors

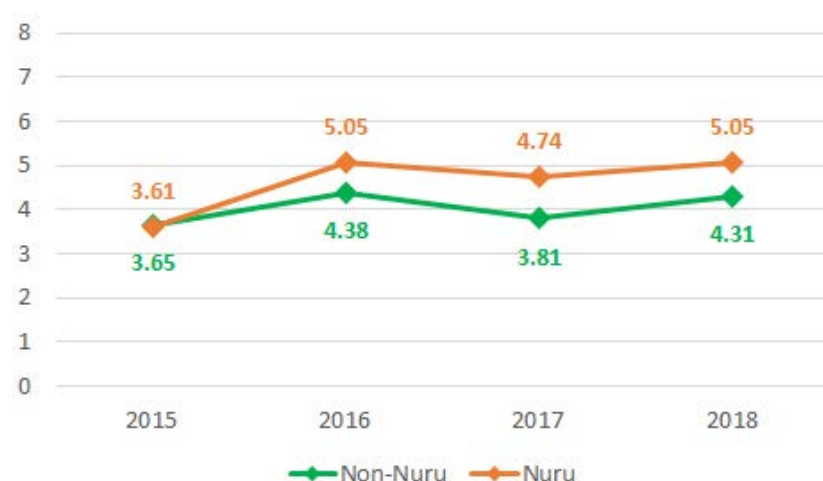
The Overall Healthy Behaviors Scorecard (Figure 9) shows that the Nuru intervention group made gains in healthy behavior adoption as compared to their own baseline and to the comparison group. In 2018, on average, Nuru households adopted 63% of the eight healthy behaviors, an increase of 40% over the baseline and a difference of 22% over the comparison group.

¹⁴ <https://www.livessavedtool.org/list-in-reports> <https://www.livessavedtool.org/list-in-peerreviewed-journals>

¹⁵ The indicator is considered fulfilled if it achieves 75% of the target

Both study groups benefited from the community-level Nuru activities including health staff training, government integrated supportive supervision accountability, maternal waiting homes creation, water source repair, Essential Nutrition in Action (ENA)¹⁶ demonstrations on complementary feeding, and nutrition counseling corners creation. The intervention group, however, also participated in the cooperative-based care group. Activities like peer to peer support and tailored interpersonal communication (TIC) provide targeted support to help overcome barriers and drive demand for community-level services.

Figure 9. Average number of 8 healthy behaviors adopted



Scorecard: Safe Pregnancy and Childbirth

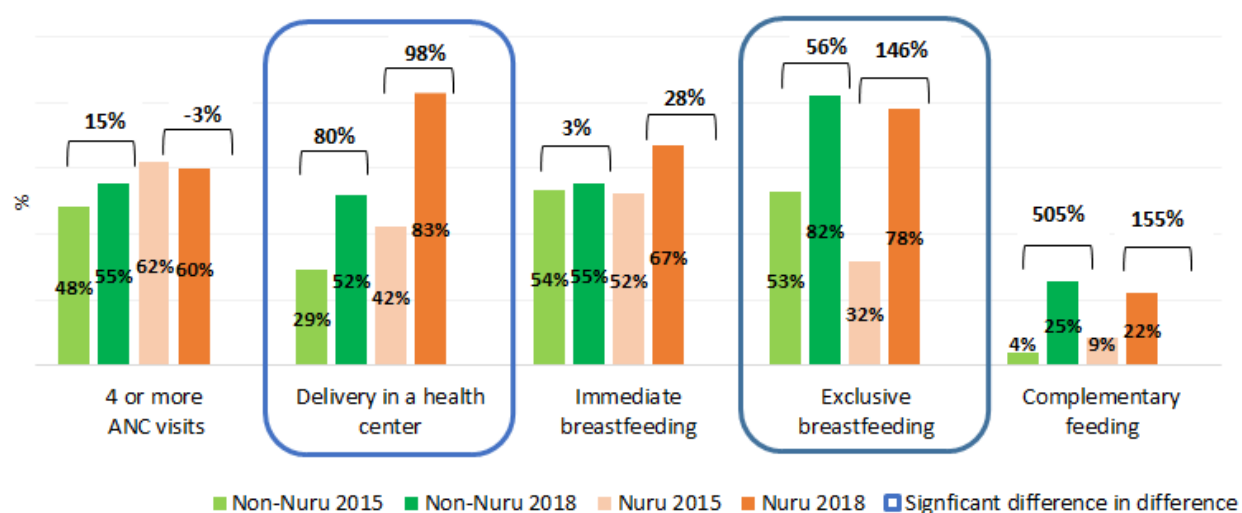
The intervention group increased safe pregnancy and childbirth behaviors by 59% over baseline while the non-Nuru group saw a 32% increase. Figure 10 shows that overall, with the exception of Nuru's ANC visits, both cohorts made positive strides in this scorecard. Nuru households demonstrated a significant difference in difference in two indicators: delivery in a health center and exclusive breastfeeding. The comparison group, meanwhile, saw big jumps in delivery in a health center, exclusive breastfeeding, and complementary breastfeeding since baseline.

A combination of factors likely contributed to the positive impact trend across this scorecard for both groups, specifically the community-focused activities that had a spillover effect for the comparison

¹⁶ WHO Essential Nutrition Actions: Improving maternal, newborn, infant and young child health and nutrition http://www.who.int/nutrition/publications/infantfeeding/essential_nutrition_actions/en/

cohort. Maternal waiting rooms constructed in Nuru communities alleviated transportation barriers to health facilities for women who live a long distance away or for women battling complicated deliveries. Nutrition counseling corners and training on pre- and post-natal care assists also contributed to improving maternal and child health. The Ethiopian Ministry of Health, the local community, and Nuru collaborated strongly on these interventions. Nuru also worked with the government to improve the training for health center staff involved in maternity.

Figure 10. Safe Pregnancy and Childbirth Indicators



Prenatal Care: On track for four antenatal care visits (ANC) during pregnancy

The Nuru group saw a small decrease of 3% as compared to baseline and last year, whereas the comparison group saw a 15% increase from baseline. Still, the Nuru group historically outperformed the non-Nuru group in this indicator.

Safe Delivery: Giving birth in a health facility

Typical challenges for safe childbirth in Ethiopia are centered around transportation difficulties. To help women overcome the transportation challenge, Nuru is working on a major initiative with local communities and the Ethiopian government to establish maternal waiting homes located next to health facilities. These waiting homes are available for women who live far away or have complex pregnancies. Given the challenges in Ethiopia with maternal death, it is encouraging to see both the intervention and comparison group make significant and large increases over baseline in their percentage of mothers

giving birth in a health facility (98% and 80% respectively). The intervention group had significantly higher rates of delivery in a health center than the comparison group, at both baseline and follow-up. The gap between the two groups has increased over the intervention implementation period.

Immediate Breastfeeding

Immediate breastfeeding behavior adoption often parallels safe delivery in a health facility if the health facility is following best practices. Immediate breastfeeding is measured as a one-time activity that gives the baby nutritionally important, habit-forming, and autoimmune boosting colostrum. Both groups scored similarly at baseline, but the Nuru cohort has consistently outperformed the non-Nuru group since then. In 2018, both groups did better than their baseline, but both groups saw decreases as compared to 2017. Nuru households dropped by 18% while the non-Nuru group dropped by 10% for this indicator.

Nuru community interventions that facilitate immediate breastfeeding include training Ministry of Health staff, ensuring cascading of this training to lower-level health staff, constructing maternal waiting homes and creating hands-on counseling corners with behavior change communications materials.

Exclusive Breastfeeding

Exclusive breastfeeding and complementary feeding are successively more difficult behaviors than immediate breastfeeding. Exclusive breastfeeding happens over 6 months and therefore has many more possible challenges. For this indicator, the Nuru group was significantly behind at baseline (40% lower than the comparison group) but made significant strides with a 146% increase over baseline. This year's results marked the highest adoption rates for this indicator for both comparison (82%) and intervention (78%) groups.

Appropriate Complementary Feeding

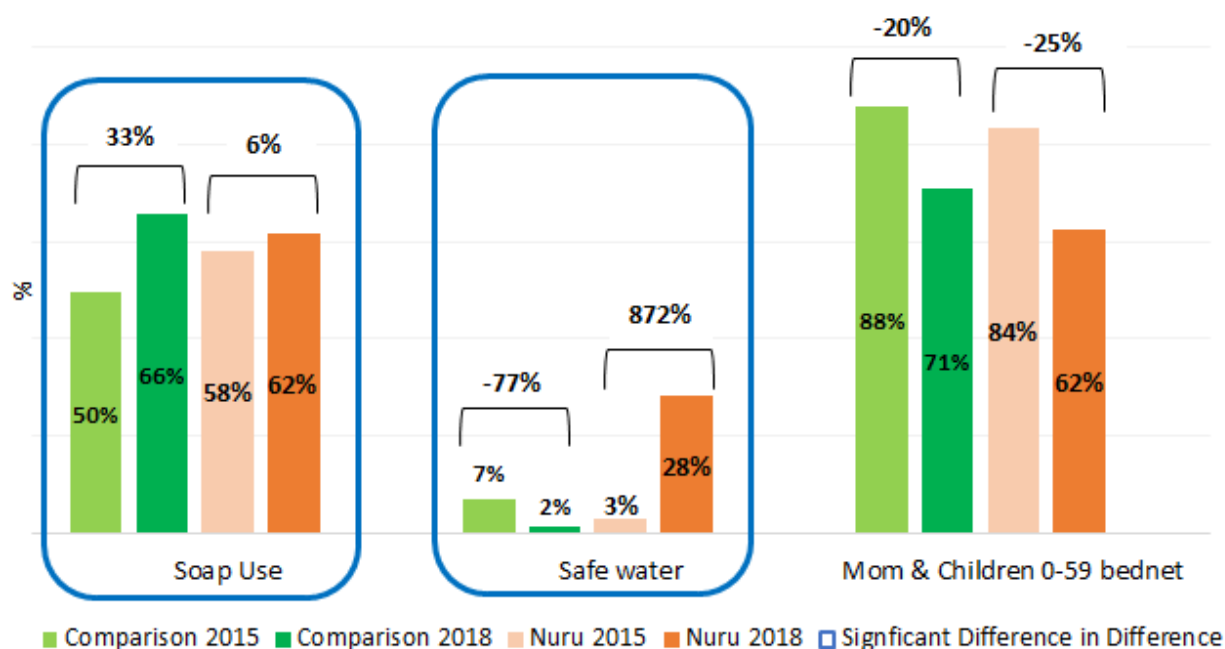
Across the study, the percentage of mothers using appropriate complementary feeding practices is at 25% or less which is low overall and is concerning for under-5 nutrition. However, both groups did have large increases in this behavior. Complementary feeding requires access to a variety of foods beyond breast milk and is, therefore, a more complex behavior to affect. In addition, this indicator

is tracked over a longer period of time. In 2017 the Nuru Healthcare team added an activity for Essential Nutrition in Action practical demonstrations in every kebele. This community-based activity was established based on recommendations from the 2016 healthcare evaluation report.

Scorecard: Safe Water, Sanitation, and Malaria Prevention

Historically, both cohorts perform similarly in this scorecard. In 2018, however, the non-Nuru group experienced a significant five percent decrease. Figure 11 shows that this decrease is driven by safe water (-77%) and bednet use (-20%). Nuru households, on the other hand, saw a five percent increase in adoption rates over baseline. The biggest change for the Nuru group is safe water (872%), but this indicator remains low overall. The non-Nuru cohort outperformed the intervention group in soap use by 6%. Both cohorts experienced a similar downward trend for bednets.

Figure 11. Scorecard: Safe Water, Sanitation, and Malaria Prevention



Sanitation: Washing hands with soap at all appropriate times

This year, both groups increased their soap use over baseline, but the Nuru group decreased by one percent from 2017 while the comparison group increased by 13%. The intervention group had significantly higher handwashing rates than the comparison group at baseline. Hand washing is key to

health, but deceptively difficult to maintain. Research shows that if everyone washed their hands appropriately, it could prevent 1 million deaths a year globally.¹⁷

Safe Water: Treating drinking water

For the second year in a row, the intervention group had a significant increase over baseline in the use of safe drinking water whereas the comparison group saw a decrease. In fact, this indicator has been on the decline for the comparison group since 2015. For Nuru, the 28% adoption rate is the highest yet. Drinking clean potable water and handwashing with soap are important for the prevention of diarrheal disease,¹⁸ which is the second-highest cause of death in children under five.

Nuru Ethiopia works to improve demand and access to potable drinking water in two ways: 1) through the repair of existing water sources with community leadership, and 2) with point of source water purification called Waterguard. The evaluation data measures how people treat the water they drink. Access to water sources is monitored but not evaluated. The Waterguard activity which provides access and creates a demand for the chlorine-based additive was introduced in late 2016. While it was not immediately popular since Ethiopians are accustomed to water treatment at the reservoir-level rather than at the household-level, it gained popularity over time through targeted messaging in 2018.

Malaria Prevention: Use of long-lasting insecticide-treated mosquito nets (LLIN)

There were moderate decreases over baseline in LLIN behavior for both the intervention group and the comparison group. At both baseline and follow-up, the comparison group had significantly higher rates of LLIN behavior compared to the intervention group. Overall, however, the 2018 timepoint is the lowest adoption rate for both groups.

There are still documented issues with malaria, even when mosquito net use was very high. The industry norm is to measure use of LLIN, but many Ethiopians prefer indoor residual spray above bed nets. The desired outcome is to reduce malaria infection, and so the intervention discusses prevention methods including LLIN, indoor residual spray and clearing the environment of mosquito breeding sites.

¹⁷ Curtis V, Camicross S. Effect of washing hands with soap on diarrhoea risk in the community: A systematic review.

¹⁸ Lancet Infect Dis. 2003; 3(5):275-81. https://www.cdc.gov/healthywater/hygiene/fast_facts.html

However, malaria is still challenging to control. Culturally, many families believe it is like the common cold, a normal part of life. Nuru will begin reporting on both the use of indoor residual spray and LLIN in the next impact study.

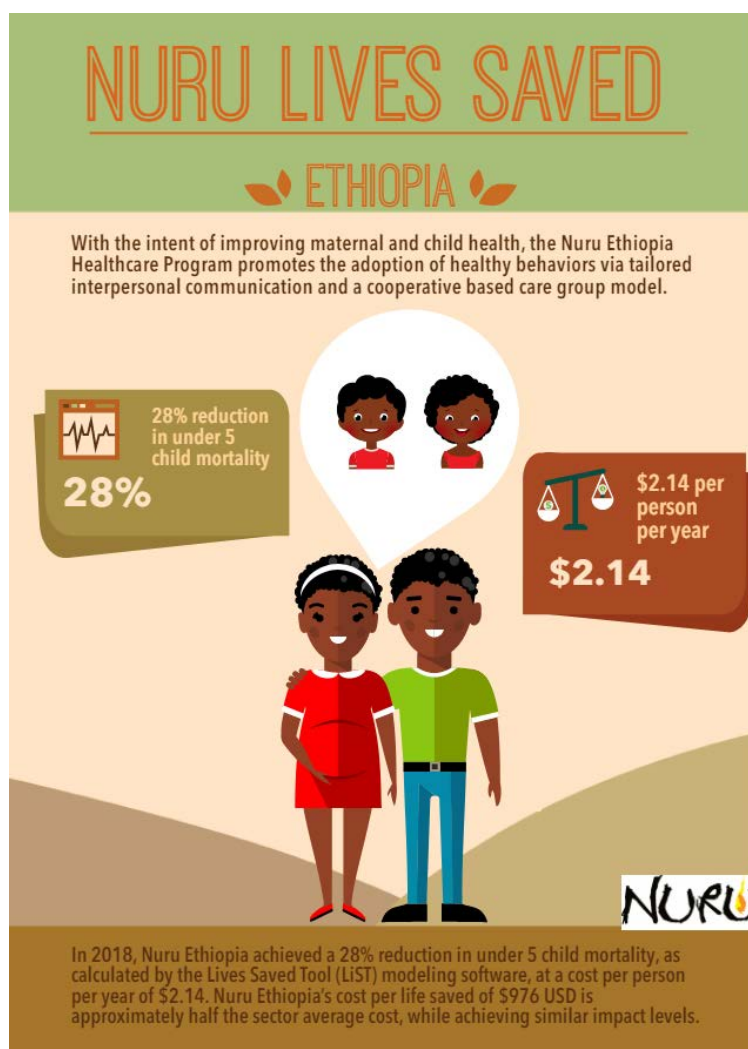
Lives Saved Tool

Nuru Healthcare's traditional scorecards track healthy behavior change over time. To assess the impact of that behavior change, Nuru applied LiST.

In 2017, LiST calculated Nuru's levels of behavior change created a 25% reduction in under-five mortality. In 2018, that number rose to 28%, which translates into 39 lives saved. (Figure 12). This is an increase from last year, but just shy of the 30% target. Over time, the rate of change will slow as this population continues to increase their healthy behavior adoption rate.

The main driver of this lives saved estimate is the delivery in a health facility behavior. The data shows that Nuru is consistently outperforming the comparison group on this indicator and has made a significant improvement over baseline. All the behaviors work together to improve MCH and many are dependent on each other for success.

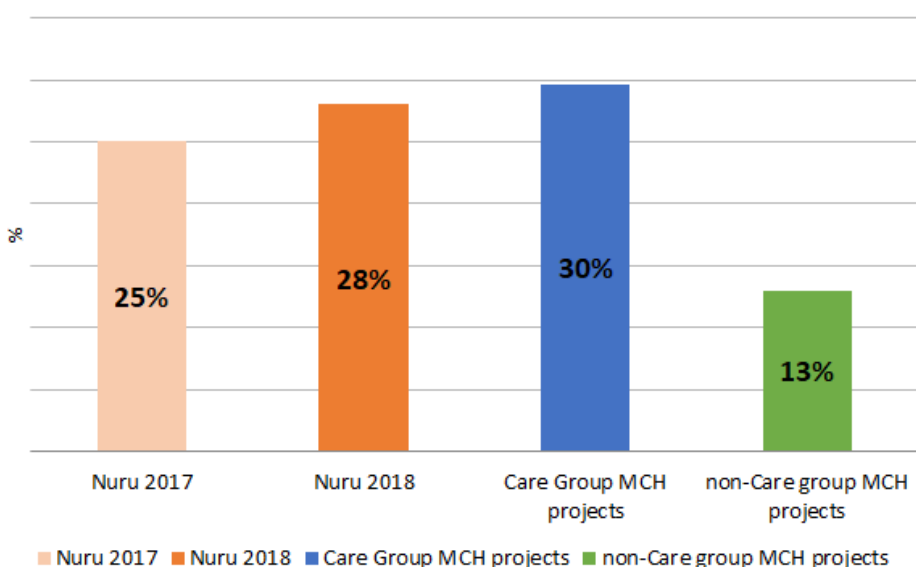
Another useful feature of LiST is that it allows for comparisons between organizations working on maternal and child health interventions. An analysis of a peer-reviewed journal article by Perry¹⁹



¹⁹ Perry, H., Morrow, M., Davis, T., Borger, S., Weiss, J., DeCoster, M., ... & Ernst, P. (2015). Care Groups II: a summary of the child survival outcomes achieved using volunteer community health workers in resource-constrained settings. *Global Health: Science and Practice*, 3(3), 370-381.

about the effectiveness of the Care Group method demonstrated that the average Care Group MCH intervention saw a 30% reduction in under-5 mortality, while the non-Care Group MCH interventions were found to have an average 13% reduction in under-five mortality (Figure 12). The cost per life saved in 2018 as calculated with the total care group programming cost is \$976 and the cost per person per year is \$2.14.

Figure 12. Estimated percent reduction in under-five mortality vs benchmarks²⁰



CONCLUSION AND RECOMMENDATIONS

In 2018, the Nuru Ethiopia Healthcare Program achieved a 28% reduction in under under-five mortality due to the healthy behavior adoption rates. Indeed, Nuru households maintained higher adoption rates over their baseline and as compared to the non-Nuru group for the past three years. In 2018, the intervention group adopted 5.05 of the 8 healthy behaviors while the comparison group adopted 4.31. With the exception of trainings being postponed due to security concerns, the monitoring targets were met and exceeded as the year progressed. Overall, the behavior change supported by

<http://www.ghspjournal.org/content/3/3/370>

²⁰ Care Groups II: A Summary of the Child Survival Outcomes Achieved Using Volunteer Community Health Workers in Resource-Constrained Settings. Henry Perry, Melanie Morrow, Thomas Davis, Sarah Borger, Jennifer Weiss, Mary DeCoster, Jim Ricca, Pieter Ernst. Global Health: Science and Practice Sep 2015, 3 (3) 370-381; DOI: 10.9745/GHSP-D-15-00052

tailored interpersonal communication within the care groups for Nuru households continues to show progress.

The Safe Water, Sanitation, and Malaria Prevention scorecard continues to be a challenge, but there have been improvements in safe water and soap use as the HC team continues its targeted messaging. The malaria prevention indicator, on the other hand, does not reflect the cultural preference in Ethiopia. While measuring LLIN is the industry norm, many Ethiopians prefer indoor residual spray above bed nets. In 2019, the scorecard will be updated to include indoor residual spray as a malaria prevention behavior.

Other recommendations and next steps include:

- Analyze the disaggregated geographic data on ANC and set up a plan to improve antenatal care attendance in needed areas.
- Continue focusing on complementary feeding and nutrition, build the program's ENA demonstration capabilities locally, drive demand for nutrition counseling corners and address household barriers through care group conversations.
- Continue safe water efforts to maintain and grow positive impact.
- Prioritizing messaging around hand washing with soap/ash at key times. This habit is particularly challenging in Ethiopia, but it is also proven to save many lives and reduce the disease burden significantly.

EDUCATION

INTRODUCTION

The Nuru Ethiopia Education Program aims to increase child literacy levels to second-grade reading levels among Nuru farmer children in early primary school (Grades 1-4). Grade 2 level literacy is generally defined where children can fluently read and comprehend basic text. For the 2017-2018 school year, Nuru offered services to 32 primary schools and 12 Nuru farmer cooperatives, serving over 13,000 children in grades 1-4.

- The core components of the Nuru Ethiopia Education model are:
- Teacher training on literacy best practice in the schools located in Nuru farmer cooperative areas, along with regular follow-up observations and feedback to teachers and administrators.
- The establishment of school libraries in the schools where teacher training is conducted.
- Training for district and school officials on leadership and management techniques.
- School-based tutorial sessions reinforce the core components of literacy for students and offer teachers another opportunity to apply their training.
- Nuru worked with schools to either co-construct, sex-segregated latrines to increase girls attendance, or reading rooms to increase the utilization of print-rich materials.

This model is based on Save the Children's Literacy Boost model. The overall focus and goal are to improve the reading skills of students in Nuru target areas, specifically focused on the five core components of literacy: letter identification, phonemic awareness, fluency, vocabulary, and comprehension.

OBJECTIVE

This report serves as the second follow-up time point to the 2016 baseline. Nuru conducted a baseline literacy assessment of a sample of its service areas in Ethiopia in 2016. A follow-up assessment was conducted in 2017 after approximately one year of Education Program services. The following presentation of individual-level data collected at the household level intends to provide an update on

the progress Nuru farmer children are making in literacy compared to a non-Nuru sample of children over two years of the Education Program in Ethiopia.

Nuru M&E supports this work by conducting an annual review of progress toward the program’s impact goal to address the evaluation question: What is the impact of Nuru Ethiopia’s Education Program on progress toward literacy and the core components of reading?

METHODOLOGY

The M&E team returned to Nuru households to capture the same children from baseline in August 2017 to assess their growth over one year of Nuru’s intervention. August was chosen as a time when children were out of school for “summer” break between school years. In addition, the same household level assessment was carried out in areas that were used as comparison areas for Nuru’s other non-educational services.

The findings presented in this report highlight those children who initially completed Grades Kindergarten and first grade in August of 2016 and were followed up within 2017 and 2018. The number of children assessed in Nuru and Non-Nuru households is depicted in the tables below.

Table 7. Education survey timeline and sample sizes

Sample	# of children surveyed in 2016	# of children surveyed in 2017	# of children surveyed in 2018	# of enumerators	Dates of training	Dates of data collection
Nuru	314	269	231	35	July 2018	Aug 2018
Comparison	216	129	182			

Table 8: Grades completed in 2018

Sample Group	# of children ²¹ that completed kindergarten ²²	# of students that completed first grade
Nuru	123	108
Comparison	39	143

Early Grades Reading Assessment (EGRA)

As a part of the evaluation strategy starting in 2016, NE M&E began using the Early Grade Reading Assessment (EGRA) for measuring literacy. The Early Grades Reading Assessment (EGRA) is currently the most commonly used early grades (grades 1-4) literacy assessment in the world. EGRA was developed in 2006-2007 by early grade reading experts at RTI and USAID in consultation with reading scholars at universities and early grade reading experts from a host of other organizations around the world. EGRA has been used by over 30 organizations in over 70 countries and translated into 120 languages.

Typically, EGRA has six main components, but this study highlights three components that were selected for their comparability to Nuru's past assessment, Uwezo, and for time purposes. The three main components of literacy assessed were: Letter Name Identification, Familiar Word Reading, and Oral Reading Fluency. From those domains, three main indicators were used to assess baseline results. Those indicators are:

- Percentage of letters correctly identified in one minute
- Percentage of words correctly read in one minute
- Number of correct words per minute (cwpm) read in a short story

For the first two domains, children were given lists of 50 letters and 50 words and asked to identify or read as many as they could. Enumerators timed them while recording their results and

²¹ These numbers reflect the matched respondents between 2016 and 2018.

²² Kindergarten completed in 2016.

stopped them after one minute was complete. For the third indicator, children were given a story and asked to read it all of the way through. Enumerators recorded how many words children read correctly in one minute, but children were allowed to finish the story if it took them longer than one minute. Only words read correctly in the first minute were recorded for analysis.

Effect Size

The growth of the children on literacy domains from the EGRA assessments in Nuru areas vs the children in non-Nuru areas was captured and compared to each other. Since the Nuru and comparison groups did not have similar baseline results, the results are standardized using a measure of “effect size.” Standardization allows for comparing groups with different starting places and even different indicators. When children change literacy levels from baseline to follow-up we can compare their change within the Nuru group and within the comparison group. Ultimately, the gain in scores between groups can be compared, which are usually represented in percentage changes, using standard deviation changes, or effect sizes. Generally, in education research 0.2 standard deviations (SD) is considered a small effect size, 0.5 SD is considered medium, and 0.8 SD is considered a large effect size.²³

MONITORING

In addition to yearly impact evaluations, the NE Education team collects monitoring data (Table 9) throughout the year. While evaluations focus on a sample of children, program teams monitor the entire Nuru farmer population. Overall, the Education team fulfilled all the monitoring targets.

²³ Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. (2nd ed.) Hillsdale, NJ: Erlbaum.

Table 9. 2018 Monitoring Results

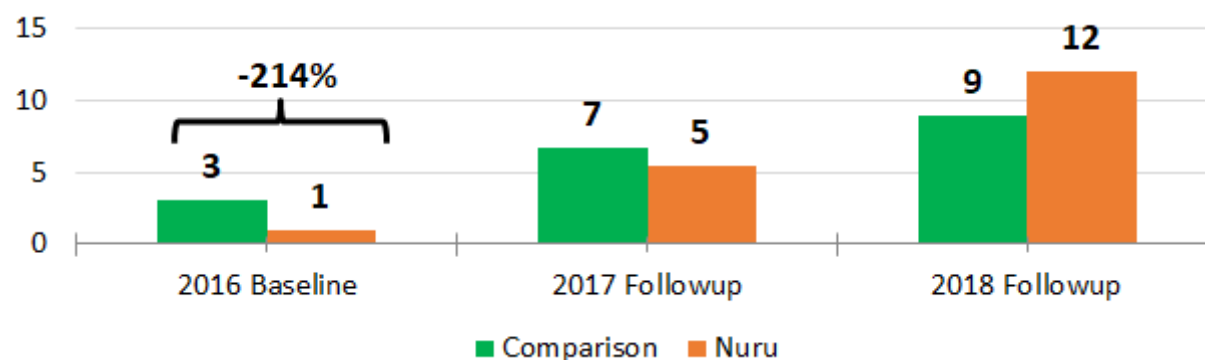
Indicator	Performance ²⁴	Target	Actual
Number of children in grades 1-4 reached		8,000	13,151
Number of teachers trained in “teaching literacy” best practices		326	287
Number of school libraries established		12	12
Percent of households with children attending tutorial sessions		60%	47%
Percent of teachers implementing best practices in literacy		65%	100%

RESULTS & DISCUSSION

As noted in the methodology section, 2016 was the first year that subtasks of the Early Grade Reading Assessment (EGRA) were administered by Nuru in Ethiopia. Most recently, Nuru also followed up using those EGRA subtasks in 2018. On the domain for average percentage of letters identified (out of 50), Nuru students grew by 11 percentage points, while comparison students grew by 6 percentage points (Figure 13). Although both cohorts significantly increased their letter identification over their respective baselines, there is no significant difference between their 2018 results. When assessing progress over time, however, effect size (Table 10) shows that Nuru students are improving at a faster rate.

At baseline, t-tests show that the comparison students outperformed Nuru students by 214%. Calculating the effect size demonstrates the gains in the sub-task despite the different baseline results (Table 10). In 2018, Nuru children saw a large effect size of 0.84 for letter identification, an increase from baseline. The comparison group had a moderate increase from baseline with an effect size of 0.44. For word identification, both groups saw a moderate effect size, though the Nuru group’s was slightly larger.

²⁴ The indicator is considered fulfilled if it achieves 75% of the target

Figure 13. 2016 - 2018 Average % of letters identified**Table 10. 2018 Effect Sizes of Nuru's impact when compared to comparison Areas**

Indicator	2018 Nuru Effect Size	2018 Comparison Effect Size	2018 Effect Size Difference
Letter Identification (EGRA)	0.84	0.44	0.40
Familiar Word Reading (EGRA)	0.42	0.39	0.03
Oral Reading Fluency (Correct Words Per Minute) (EGRA)	NA due to small sample size		

As students are seeing gains on letter identification, both groups also saw an increase in average percentage of words identified over time (Figure 14). In 2016, neither group could read any words, but by 2018, Nuru children could read about 4% of the words in the assessment while the comparison children identified about 6%. Between 2017 and 2018, the comparison students increased the number of correct words identified per minute by 67% while Nuru students increased by only 20% (Figure 15). Unfortunately, the sample sizes were too small to perform t-tests (Table 11).

Table 11. 2016 - 2018 Sample sizes by EGRA sub-task

Average % of Letters Identified	Sample size	
	2016 Baseline	2018 Followup

Nuru	231	231
Comparison	182	182
Sample size		
Average % of Words Identified	2016 Baseline	2018 Followup
Nuru	14	124
Comparison	27	81
Sample size		
Average # of Words in a Paragraph Identified	2016 Baseline	2018 Followup
Nuru	0	23
Comparison	1	18

Figure 14. 2016 - 2018 Average % of words identified

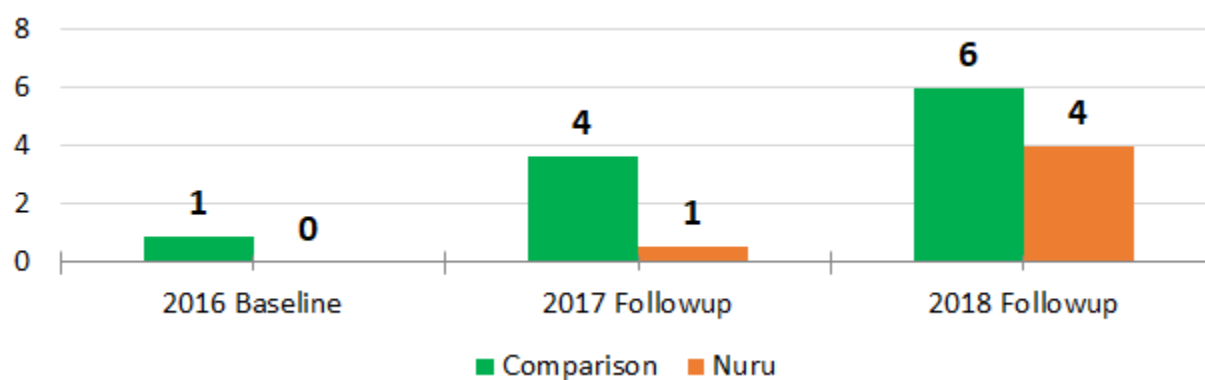
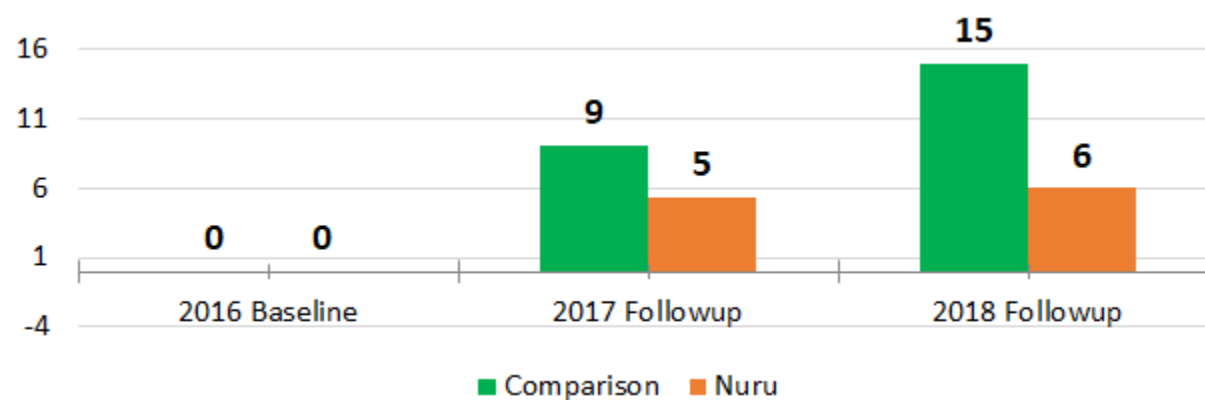


Figure 15. 2016 - 2018 Number of correct words per minute



LIMITATIONS

While Nuru farmer children saw gains in literacy, Nuru recognizes there are limitations to this study. As this study follows students who initially completed Kindergarten and first grade in August of 2016, children have likely either graduated or dropped out of school by 2018. The diminishing sample sizes did not allow for testing statistical significance for two out of three indicators. Additionally, the results of this analysis only compare average scores across Nuru farmer children and non-Nuru farmer children. Control variables and other factors are not included, which may have some effect on the overall assessment of impact. For example, there is likely to be spillover from the Nuru intervention into the comparison areas due to working with Woreda (district) officials who are implementing some of Nuru's best practices across the entire area. It is not possible to estimate this spillover effect on the comparison group's growth, but it should nevertheless be noted.

CONCLUSION AND RECOMMENDATIONS

In 2018, Nuru and comparison students saw increases across all EGRA sub-tasks, especially in letter identification. While there is still room for growth, both cohorts are benefitting from the Nuru teacher training and tutorial classes in the schools. Operationally the Education team redoubled their focus after the 2017 program review process on activities that increased literacy at the most basic levels. The growth in letter recognition is encouraging, though there is still a long way to go. Based on the data from this report Nuru Ethiopia will continue to focus its efforts on how to effectively teach letter identification and word decoding skills due to the lack of these basic literacy skills in the catchment area. The education team will also be working to sustainably hand over operations of its key activities to government partners in the areas where it has been working the longest in 2019.

In 2019 the Education team is continuing to focus on literacy basics at school in addition to the following:

- Strong follow up on behavior change communication started in Q4 2018 to encourage parents to support their children's literacy efforts via role-playing, drama, and interactive discussions.
- Reading rooms constructed in 2018 need close follow up to empower the community to use locally available materials (like local mats for furniture) to operationalize the reading rooms for

use by students. Likewise planning for correct use, maintenance, and cleanliness of the latrines constructed in 2018.

- As Nuru continually strives to improve services to the community, high-quality genuine data is a very important guide. Refresher training on the data collection tools and its importance could reinforce this for both Nuru-level and school-level data collection.